

Nikhil R. Chari

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Dept. of Organismic and Evolutionary Biology
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Research interests.

terrestrial biogeochemistry | ecosystem ecology | global change biology | soil carbon dynamics

Education.

Harvard University

PhD in Biology

2020 - present

Advisor: Dr. Benton Taylor

University of California, Berkeley

BS in Chemical Biology with High Honors

2016 - 2020

Minor in Earth and Planetary Science

Publications.

In review

5. Chari, N.R., Muratore, T.J., Frey, S.D., Winters, C.L.⁺, Martinez, G.⁺, Taylor, B.N., 2024. Long-term soil warming drives different belowground responses in arbuscular mycorrhizal and ectomycorrhizal trees.

Published

4. Chari, N.R., Tumber-Dávila, S.J., Phillips, R.P., Bauerle, T.L., Brunn, M., Hafner, B.D., Klein, T., Obersteiner, S., Reay, M.K., Ullah, S., Taylor, B.N., 2024. Estimating the global root exudate carbon flux. *Biogeochemistry* 167, 895–908. <https://doi.org/10.1007/s10533-024-01161-z>
3. Chari, N.R., Taylor, B.N., 2022. Soil organic matter formation and loss are mediated by root exudates in a temperate forest. *Nature Geoscience* 15, 1011–1016. <https://doi.org/10.1038/s41561-022-01079-x>
2. Chari, N.R., Lin, Y., Lin, Y.S., Silver, W.L., 2021. Interactive effects of temperature and redox on soil carbon and iron cycling. *Soil Biology and Biochemistry* 157, 108235. <https://doi.org/10.1016/j.soilbio.2021.108235>
1. Dykes, G.E., Chari, N.R., Seyfferth, A.L., 2020. Si-induced DMA desorption is not the driver for enhanced DMA availability after Si addition to flooded soils. *Science of The Total Environment* 739, 139906. <https://doi.org/10.1016/j.scitotenv.2020.139906>

Selected presentations.

Oral presentations

Chari, N.R. and Taylor, B.N. Root exudation rate and exudate composition are independently regulated by CO₂ levels. Ecological Society of America Annual Meeting. Long Beach, CA. August, 2024.

Chari, N.R. Arbuscular mycorrhizal and ectomycorrhizal trees exhibit different root nutrient acquisition strategies in response to long-term soil warming. Harvard Forest LTER Symposium. March, 2024.

Chari, N.R., Muratore, T.J., Frey, S.D., Taylor, B.N. Long-term soil warming mediates relationships between root exudation and soil carbon dynamics. Ecological Society of America Annual Meeting. Portland, OR. August, 2023.

Chari, N.R. Root exudates as hidden mediators of soil carbon storage. Arnold Arboretum Research Talks. Boston, MA. February, 2023.

Chari, N.R., Aguilar, A.A.⁺, Taylor, B.N. Soil heterogeneity outweighs the effects of root exudation on SOM in a temperate forest. American Geophysical Union Fall Meeting. New Orleans, LA. December, 2021.

Chari, N.R. and Taylor, B.N. Assessing the impacts of root exudation on soil organic matter dynamics. Harvard Forest LTER Symposium. March, 2021.

Posters

Chari, N.R., Muratore, T.J., Winters, C.L.⁺, Martinez, G.T.⁺, Taylor, B.N., Frey, S.D. Trade-offs between root exudation and respiration under long-term soil warming. LTER All Scientists Meeting. Monterey, CA. September, 2022.

Chari, N.R., Lin, Y., Lin, Y. S., Silver, W.L. Interactive effects of temperature and redox on soil biogeochemical processes. American Geophysical Union Fall Meeting. San Francisco, CA. December, 2019.

Chari, N.R., Lin, Y., Lin, Y. S., Silver, W.L. Temperature dependency of anaerobic microbial activities in a temperate vs. tropical soil. American Geophysical Union Virtual Poster Session. October, 2019.

Co-authored conference abstracts.

Muratore, T.J.*⁺, *Chari, N.R.*, Knorr, M.A., Phillips, R.P., Taylor, B.N., Frey, S.D. Belowground plant carbon inputs mitigate elevated soil respiration observed under warming and nitrogen addition. Plant Biology Initiative Symposium. Boston, MA. May, 2024.

Church, L.A.*⁺, Taylor, B.N., McCulloch, L.A., *Chari, N.R.*, Berlingeri, C., Prada, C., Heslop, C., Schuster, W., Terlizzi, K.. Oak mortality leads to increased diversity and shifting community composition of soil fungi in a temperate hardwood forest. Ecological Society of America Annual Meeting. Portland, OR. August, 2023.

Muratore, T.*⁺, *Chari, N.*, Knorr, M., Simpson, M., Phillips, R., Melillo, J., Taylor, B., Frey, S. Long-term soil warming interacts with mycorrhizal tree type to constrain ecosystem carbon loss in a mixed arbuscular mycorrhizal and ectomycorrhizal forest. Ecological Society of America Annual Meeting. Portland, OR. August, 2023.

Winters, C.*⁺, Martinez, G.⁺, *Chari, N.*, Muratore, T., Frey, S.D., Taylor, B. Forest carbon cycling belowground: changes in root-based carbon flux under warming temperatures. SACNAS National Diversity in STEM Conference. San Juan, PR. October 2022.

Berlingeri, C.*⁺, *Chari, N.*, Church, L., Heslop, C., Liao, W., McCulloch, L., Schuster, W., Terlizzi, K., Taylor, B. How drivers of the forest understory shift between biotic and abiotic controls based on deer browsing and oak mortality. Ecological Society of America Annual Meeting. Montreal, CA. August, 2022.

Berlingeri, C.*⁺, Heslop, C., Terlizzi, K., *Chari, N.*, Church, L., DeGroot, K., Liao, W., McCulloch, L., Taylor, B. Biotic and abiotic drivers of recovery in a northeast oak-hickory forest. Plant Biology Initiative Symposium. Boston, MA. May, 2022.

Mackie, C., Xu, B., Kostko, O., *Chari, N.*, Zhang, E., Head-Gordon, M., Ahmed, M*. A molecular view of glycerol-water hydrogen bonding patterns. American Physical Society March Meeting. Denver, CO. March, 2020.

Dykes, G.E.*⁺, *Chari, N.R.*, Seyfferth, A.L. Silicon induces arsenite and monomethyl arsenic release from soil solids: the casus belli of microbial chemical warfare? Goldschmidt. Barcelona, Spain. August, 2019.

Dykes, G.E.*⁺, *Chari, N.*, Seyfferth, A.L. Methylated arsenic dynamics in silicon-amended flooded rice paddies. SSSA International Soils Meeting. San Diego, CA. January, 2019.

*presenting author

⁺undergraduate mentee

Teaching.

Harvard University

Graduate Teaching Fellow

2021 - 2023

Courses: **OEB 10:** Principles of Biological Diversity; **OEB 55:** Ecology: Populations, Communities, and Ecosystems; **EPS 164:** Environmental Chemistry; **ESE 6:** Intro to Environmental Science and Engineering

Mentorship.

Harvard Forest Summer Research Program in Ecology	2021 - 2023
- Arturo Aguilar, Cristina Winters, Gabriela Martinez, Isa Gooijer, Anisa Robinson	
Harvard College Research Program	2021, 2024
- Arturo Aguilar, Finn Crawford	
Harvard Museum of Comparative Zoology GUR	2024
- Ian Palk	
Harvard College Program for Research in Science and Engineering	2024
- Isabella Cao	

Research awards.

ESA Soil Ecology Student Travel Award (\$200)	2024
Botanical Society of America Graduate Student Research Award (\$1500)	2024
Harvard Forest LTER Graduate Student Research Award (awarded 3x, \$7500 total)	2020, 2022, 2023
US Carbon Program Leadership Award (\$1013.60)	2021
Harvard Graduate Student Council Conference Grant (\$750)	2021

Fellowships & awards.

ESA Biogeosciences Elizabeth Sulzman Award for Excellence in a Graduate Student Publication (\$400)	2023
Harvard University Certificate of Distinction in Teaching (awarded twice)	2021, 2022
Harvard University Skaff Family Environmental Graduate Fellowship (\$5000)	2020
Second Place, AGU Virtual Poster Session Undergraduate Showcase	2019
Rose Hills Independent Summer Undergraduate Research Fellowship (\$5000)	2019
University of Delaware CANR Summer Institute Fellowship (\$4000)	2018

Press.

“Getting to root of possible carbon storage changes due to climate change.” Harvard Gazette. 2023

Reviewer.

Biogeochemistry; Earth’s Future; Environmental Science & Technology; Global Change Biology; New Phytologist; PeerJ; Plant and Soil (2); Plant, Cell & Environment (2)

Memberships.

American Geophysical Union
American Public Gardens Association
North American Carbon Program
Botanical Society of America
Ecological Society of America